

U. S. DEPARTMENT OF AGRICULTURE.
BUREAU OF ANIMAL INDUSTRY.

THE DAIRY INDUSTRY
IN MISSOURI AND KANSAS.

BY

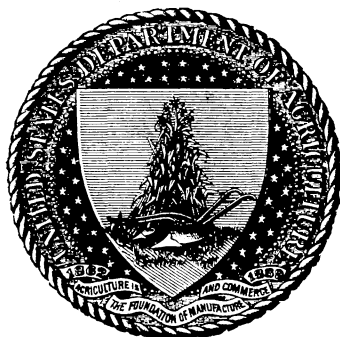
LEVI CHUBBUCK,

Special Expert Agent, Dairy Division.

Under the direction of

Dr. D. E. SALMON,

Chief of the Bureau of Animal Industry.



WASHINGTON:
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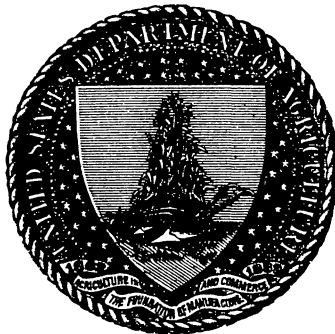
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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY,
Washington, D. C., May 25, 1897.

SIR: I have the honor to transmit herewith, for publication as a bulletin of this Bureau, the manuscript of a report prepared under the direction of Maj. Henry E. Alvord, Chief of the Dairy Division, by Mr. Levi Chubbuck, special agent of that division, on the development and present condition of the dairy industry in the States of Missouri and Kansas.

Mr. Chubbuck was for a time secretary of the Missouri State Board of Agriculture, and has been secretary of the Missouri State Dairyemen's Association since its organization.

Very respectfully,

D. E. SALMON,
Chief of Bureau of Animal Industry.

HON. JAMES WILSON,
Secretary of Agriculture.

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THE DAIRY INDUSTRY IN MISSOURI AND KANSAS.

INTRODUCTION.

Not many years ago it was assumed that New England and New York, with perhaps a part of Ohio added, would be able to supply the American demand for dairy products. It was thought that dairying would be mainly confined to the territory indicated, notwithstanding the growth of other sections, because the conditions in the West and South, generally, were deemed so unsuited to this industry as to prevent its extension in those directions.

The development of the commercial and manufacturing interests of the East made it soon apparent, however, that the farmers of that region could not supply the demands of its teeming population for food products. Meanwhile emigrants from the Eastern States pushed westward, located in the wooded lands of Ohio and Indiana and on the prairies of Illinois, and then crossed the Mississippi to occupy the fertile lands of the great agricultural basin which includes the States of Missouri and Kansas.

Cows came with the settlers and found the natural pasturage and other conditions very favorable to stock raising and milk production. Dairy cattle rapidly increased, and the farmers soon had before them the problem of how to utilize their surplus milk. Eastern demand for butter and cheese was found to increase about as fast, and the recognized "dairy belt" was gradually extended to include Ohio, Indiana, Illinois, Michigan, Wisconsin, and Iowa. It was still maintained that south and west of these States dairying could not be successfully pursued. These views were also destined soon to be proved erroneous.

It is now safe to assert that a territory of nearly 100,000,000 acres within the limits of Kansas and Missouri offers as great possibilities for dairying as any equal area on the globe. Such possibilities can only become realities through the abandonment of many ideas as to what were once regarded essentials in dairying, as, for example, that flowing spring water and a reliable supply of ice must be had on every dairy farm; that dairying can be made profitable only with permanent pastures and cultivated grasses, and that the dairyman must be near the consuming market. It is now conceded that well and cistern water raised to the surface by windmill pumps is a satisfactory solution of the water problem; that the community factory system, with power

separator or the hand separator on the farm, for butter making, obviates the necessity for a farm ice supply; that far more cow food can be grown on an acre in corn, sorghum, millet, clover, and cowpeas than can be produced in pasture grass, allowing the cow to feed herself, thus making winter dairying more profitable than summer; and that the modern fast-freight refrigerator-car system of transportation for perishable products practically puts the dairymen of the West as close to the market as are those of the East. Hence, it should begin to dawn on the world that in Missouri and in her sister State on the west (Kansas) can be produced a large part of its supply of butter and cheese, of a quality unsurpassed and at a cost which will defy competition.

Regarding the suitableness of this region for producing dairy goods of high grade, it is only necessary to state that Missouri butter shown at the Columbian Exposition of 1893 scored within one point of perfection, and that Kansas butter was one of the first prize winners. As to possibilities of production, if one-tenth of the total area of Missouri and Kansas should be devoted to dairying, with 4 acres to a cow, and the cows yield an average of 200 pounds of butter a year, there would be produced annually over 500,000,000 pounds of butter, which, at 10 cents a pound, would make \$50,000,000, to say nothing of the returns from the skimmed milk fed to calves, pigs, and poultry.

This, too, would mean an enormous increase in the value of farm property, because of better improvements, more careful saving of manure, and better system of farming, all of which almost invariably accompany the development of dairying.

Much more might be said as to the good effect of a development of the dairy industry; how it would result in decreasing the size of farms and consequently increasing the number, each with a set of farm buildings to be added to the total wealth of the community, shortening distances between neighbors, increasing school, church, and social facilities, building up towns as consuming centers, and many other advantages.

PRESENT STATE OF THE DAIRY INDUSTRY IN MISSOURI AND KANSAS.

OBSTACLES.

In recent years Missouri has not shown that growth in dairying that was expected. There are a number of reasons for this. One of the most potent is that the population of the State originated, to a considerable extent, in Kentucky, Tennessee, and the South Atlantic States, where, under former farming systems, the milking of cows and the making of butter were not regarded as a man's work and were considered of too small consequence to engage attention as a source of farm revenue. The average Missouri farmer clings pretty closely to the ways of his ancestors.

However, the low prices for horses and cattle that have prevailed

during recent years, decreasing returns from corn and grass lands and causing sheriff's sales, have been a convincing argument to many. Farmers see that dairying may keep one closely at home and prevent active participation in all the political meetings and campaigns, attendance at all public vendues, and going to town two or three times a week and for all day on Saturday. But when it brings in during the year more money than has been spent, and the farm in the meantime has been growing more productive because of the manure made and returned to the land, it is evidently not such a bad business after all.

This is being proven, too, by the success attained by a goodly number of farmers who have come from the Northeastern States and brought with them the idea that if they looked after the dimes the butter brought, the dollars would show up in the bank account. Then there are communities of German farmers always successful when they engage in dairying, thus proving conclusively that with proper care and skill dairying can be made profitable in Missouri.

Another serious hindrance to the development of the dairy industry in Missouri is the work done in recent years by firms of butter and cheese factory builders. The bad effects of this will continue to be felt for years to come. A decade or more ago conditions were ripe for a rapid development of the dairy industry in that State. The creamery "promoters" took advantage of the opportunity. The factory idea was new, and the people, being for the most part ignorant regarding dairying and the requisites for success and profitable returns, were easily induced, in scores of instances, to subscribe for stock in plants costing from \$5,000 to \$8,000, which could have been easily duplicated for \$2,000 to \$3,000. These plants, too, were in almost all cases of capacity much beyond the requirements of the communities in which they were located, and in many instances were placed where there was an almost entire lack of interest in the enterprise among the farmers. As a consequence, they could not be successful. As soon as the people of the communities found that they had been deceived or misled, which was usually before the creamery was ready for operation, they naturally regarded the business itself a failure and a fraud. This feeling spreading to the farmers, but few of them became patrons, and these in a half-hearted way. The cattle at hand were from stock long bred almost exclusively for beef, and, with inexperience in handling even selected animals as milch cows, it was impossible to realize the yearly returns which had been unscrupulously promised. Hence there was disappointment and discouragement at all points. The double load of excessive investment and inexperience soon broke down the enterprise.

As a result, dead creamery plants were to be found in almost every county of the State, causing great depression to the dairy industry as a whole. To these unprincipled "creamery sharks" is mainly due a direct loss to people in the State, largely farmers, of at least half a million dollars. The agriculture of the State at large suffered a loss very

much greater in the serious check given to the extension of dairying by the unsuccessful butter and cheese factories.

Another cause for these failures was that most of the early Missouri creameries were built upon the wrong plan. The dairy centrifuge had not been perfected or generally introduced, and the early factory was arranged on the cream-gathering plan, which, unless combined with the farm separator, is dependent upon conditions which are unattainable in the greater part of the State. Attempted changes to the separator system were expensive and disastrous. Still further, imitation butter appeared during the same period, and enormous quantities came into the markets of the State in disguised competition with butter, causing great reduction in the selling price of the genuine article.

Notwithstanding the discouragements which have thus attended the development of the dairy industry in Missouri, the present outlook (1896) is much more encouraging, and this in spite of the very low prices prevailing for dairy products.

The same conditions did not apply to hinder the development of dairying in Kansas. That State was settled at a later time; its farmers at first naturally followed grazing and grain growing. These continued to be the leading agricultural interests until a recent period, when dairying, under the creamery system, was successfully introduced and has been rapidly extended.

ADVANTAGES.

As already stated, Missouri and Kansas possess unsurpassed natural advantages for dairying. Their geographical position is unexcelled, for they escape the rigors of the northern winter and the ill effects of the intense heat of the States farther south. In the extreme northern portions of these two States continuous stabling of cows is required for but little more than four months in the year, and during this period there are not more than a dozen days so severe that the cows can not with perfect safety be turned out of doors for exercise and fresh air. From the northern border, through 300 miles of latitude to the southern line of Missouri, there is a constant shortening of the cold season, and in the southern portion cows can graze during a large part of the winter.

While such is the case, it must not be understood that shelter and winter feeding can be dispensed with. Too many of our farmers have made that mistake to a greater or less degree. But the practical and intelligent dairyman sees that such a climate imposes much less expense on the business for stabling and maintenance than is required by one of longer continued cold. Winter dairying can be carried on successfully. All the necessary conditions exist, including the easy and cheap production of an abundant supply of ensilage. Indian corn seems to be the cheapest and best general-purpose food for dairy cattle, whether harvested as ensilage or in dry form, and nowhere in the world can it

be grown to greater advantage than in Missouri and Kansas. In no other region can there be grown a greater variety of supplemental crops—red clover, cowpeas, sorghum, millet, and others—and these constitute the basis of excellent and cheap rations for dairy cows. Within these and adjacent States are grown flax and cotton, the seed of which is worked up in the extensive mills of St. Louis and Kansas City, thus giving the farmers the advantage of the oil meals for stock food at the lowest possible prices.

Another advantage given by the geographical position of Missouri and Kansas is that markets for dairy goods are to be found in almost all directions, with large distributing and consuming centers within their borders. As a matter of fact, the home market has never yet been fully supplied with butter and cheese of local production. The city of St. Louis alone consumes annually hundreds of tons of butter and cheese shipped in from other States.

TOPOGRAPHY.

The topography of this region may be briefly described.

MISSOURI.

If a line be drawn from the northeast corner of the State to the southwest corner, nearly all of the prairie country will be found north and west of this line. This section is divided into several drainage areas served by numerous streams and their branches, all making their way to the Missouri River, which flows through the center of the State. On the lowlands along these streams the early settlers found abundant timber, and a dense growth of prairie grasses upon the uplands. The general surface is rolling, with an exceedingly small proportion of waste land. This is a region of unsurpassed agricultural resources, having an easily worked, fertile soil, with timber enough for home use, and being well watered and well supplied with railroads. Southeast of the line before mentioned, particularly south of the Missouri River, is the Ozark Mountain region. This is an extensive plateau, traversed by the St. Louis and San Francisco Railroad along its highest elevation from St. Louis to the southwest corner of the State. There is a much larger proportion of waste land in this part of the State, but much of that which is regarded as of little value for cropping affords good pasturage and will in time be the home of vast numbers of cows. Land is cheap, and with the mild climate this should be an ideal place in which to raise calves for dairy cows, a business which can be made very profitable.

KANSAS.

Kansas is much less diversified. The extreme eastern part of the State is generally rolling prairie, like western Missouri, with some timber along the streams. To the westward the timber decreases and disappears, and the grasses change to the varieties adapted to the

arid and semi-arid plains. The map at page 14 shows the creameries of Kansas to be mainly found at present in the eastern and eastern-central parts of the State, but they are being rapidly established farther westward. A few years ago the thought that dairying could be made profitable in this region would have been generally regarded as absurd. At the present rate of development it will not be many years before Kansas will appear almost as thickly dotted with creameries as Iowa is to-day.

METHODS OF FEEDING.

The general practice of dairy farmers in both Missouri and Kansas is to pasture their cows during the summer. The soiling system is practiced to a very limited extent, although there is a growing tendency in that direction. At present the practice is to grow a field of fodder corn or sorghum to be cut green and fed to the cows when pastures begin to get short from drought. The feeding of grain to the cows while on pasture, though as yet but little practiced, is growing in favor. Wheat bran can usually be bought for \$10 and ship stuff (middlings) at about \$12 a ton. Oil-cake (linseed) meal costs from \$20 to \$25 a ton. The use of a little of these foods at night and morning is found by the dairymen to help out the pastures, keep up the milk flow, and maintain the cows in good condition. With many it takes about four acres of land to winter and summer each cow. Others are feeding so that they can make one-half that area of land do the work, while a few have learned that by means of the soiling system for summer and the silo for winter feeding, properly supplemented with grain, they can make one acre furnish as much cow food as was formerly done by four.

PASTURE.

Blue grass (*Poa pratensis*) is the favorite pasture grass, its chief merit being in its characteristic early and late growth, thus prolonging the pasture season. In fact, with sufficient land in blue grass, one can have pasturage the greater part of the year. In this climate, after the seed stalk is thrown up, which is early in the spring, there follows a dense growth of long, flexible blades, which on the approach of winter lie recumbent and continue green underneath, so that stock graze upon it whenever it is not covered too deep with ice and snow. In midsummer, when rains are infrequent, blue grass does but little good, particularly if it has been grazed closely in the spring. To the man who became possessed of large tracts of land when values were low, or who inherited an estate of broad acres, blue grass is the acme as a pasture grass. It enables such a person to keep a large amount of stock with small expenditure of labor. It is an unsurpassed stock food, rapidly producing flesh of excellent quality. As a dairy pasture nothing is better, giving to butter at all times of the year the rich June color which is so highly prized. But in these later days, when dairying

as well as all other lines of farming must be placed on a business basis, and interest on one's investment, which in most cases includes land ranging in value from \$50 to \$100 an acre, must be included in the expense account, the matter of two or three extra acres to a cow is important. It is found that to conform to the present low prices and small margins, blue grass comes far from meeting the requirements. If it would grow as one of a mixture of grasses it would be valuable in permanent pastures, utilizing land that can not well be cultivated; but it will submit to no joint occupancy of the land with other grasses. It will not stand close grazing, and, as before remarked, it makes little or no growth during midsummer, hence the dairy farmers of Missouri are depending less and less on blue grass for pasture. At present fully half of the pasturage is blue grass, but this is being fast replaced with timothy, orchard, and other grasses and clovers.

PASTURING HARVESTED CORNFIELDS.

The pasture season usually covers about seven months, extending from the middle of April to the middle of November. During the early part of winter a common practice is to turn the cows and other stock into the cornfields from which the grain has been gathered, the stalks having been left standing. Much of the fodder is eaten, together with such weeds and grass as may have been allowed to grow, and corn ears overlooked in the harvesting. If these stalk fields are thus utilized before there have been severe frosts and continued rains, the stock will gain something from them; otherwise, about all they get of value is the grain. More trouble and loss of neat stock is suffered from this practice than from almost all other causes. It is a practice of the general farmers rather than of the dairymen, for the latter have found that while stalk fields can be bought for 25 to 50 cents an acre, they do not supply profitable food when treated in this way.

FEEDING CORN FODDER.

If they raise corn themselves, it pays to cut the stalks before they are weather beaten, and put them into shocks 12 by 12 or 16 by 16 hills square. The general practice according to this plan is to husk out the corn and shock or haul to the barn and stack the fodder, feeding it uncut in the yard. Yet this affords very little gain over field feeding. Many are, however, buying fodder cutters or shredders, with which to cut or crush the fodder, and this is a most economical and commendable advance. Others do not husk the corn, but cut up stalks and ears together, thus feeding the grain with the fodder. If the earless stalks are cut, the short fodder is usually moistened and mixed with ground grain, bran, ship stuff, and a little oil meal, making a mixture that is readily eaten by cows, with very little waste. By these methods of utilizing the corn fodder, many dairy farmers are proving the correctness of experimental results published by the agricultural

stations in several States, which show that the stalks or fodder of an acre of corn contain as much nutrition as the grain from the same land. The only work necessary to make this food material available and profitable is to put it into such mechanical condition that cattle will consume it without waste. With modern methods and appliances this can be easily done. Uncut corn fodder is troublesome to handle in the barn, and if fed loosely in the yard most of it is wasted. The writer has fed corn to cows during the past winter in a way that is quite satisfactory. Stalls were made, each for two cows, but with a simple, long manger, so wide and deep that an armful of uncut corn could be laid in at full length. Ears were not removed from the stalks, thus feeding to the cows the entire corn plant (minus the root), with no labor or preparation, and saving the cost of husking, shelling, and grinding the grain and cutting the fodder. The stalks are not eaten as closely as when run through a fodder cutter or shredder, yet when a comparatively small stalked variety is grown, and the corn cut at the proper age, the amount of refuse is surprisingly small. Considerable unmasticated and undigested corn passes through the cows, but with pigs to clean up after them this need cause no waste. After having fed corn in the different ways recommended, this method generally suits so well that the fodder cutter often stands idle in the winter. Other grain has been fed separately to balance the too carbonaceous corn, with occasional feeds of sorghum fodder, millet, and clover hay. The results have been very satisfactory as to the condition of the cows, their milk flow, and the cost of keeping and labor.

If properly managed, the corn fodder, which heretofore in the corn-growing States of the West has been largely wasted, can be converted into cow food of almost incredible value. There are grown yearly in Missouri over 6,000,000 acres of corn. Of this less than half is cut up for fodder, so that at least 3,000,000 acres of corn fodder are practically allowed to go to waste. This is enough to winter, on a liberal allowance and with other feed in proper proportion, 1,000,000 cows, which, if fresh in the autumn, could be made to yield a profit of \$10 a head from this winter's feeding, making a total return of \$10,000,000.

FEEDING WHEAT STRAW.

Another article of cow food produced largely in Missouri and Kansas is wheat straw; but this is wasted for the most part and in many cases burned. When fed, the usual custom is to let stock run to the stack of straw in winter, eating what they want, but wasting more. Probably a million tons of wheat straw are thus wasted annually in Missouri. Although this material is far from being as nutritious as cornstalks, it furnishes bulk and has some food value; if properly balanced with bran, oil meal, and clover hay, this straw would keep through the winter at least 500,000 head of cows.

What is true in these respects of Missouri is correspondingly

applicable to Kansas, both being corn-growing States and having also a large acreage of wheat.

In no other way can this enormous quantity of stock food, corn fodder, and wheat straw, now wasted, be utilized to so good advantage as by feeding to cows. No other class of stock will eat it so readily or make so good returns for it, if given proper shelter, daily care, and the supplemental grain food necessary to fully utilize these coarse materials.

WATER SUPPLY.

An adequate supply of good water is a requisite for success in dairying, but all of our Western dairymen have not fully recognized this important matter. It is true that there are natural obstacles to providing such a supply. Excepting the Ozark region of south Missouri, flowing springs are not found as commonly as in the hill countries of the Northeastern States, yet the farmers of Missouri and Kansas have it within their power to secure an adequate supply of pure water.

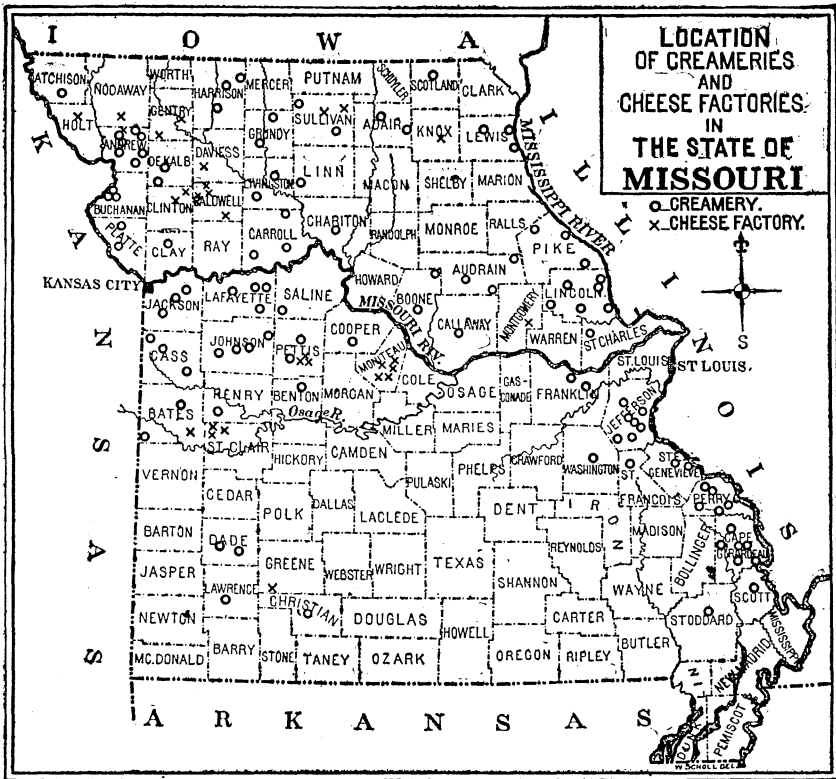
Wells are easily dug or bored, and at depths varying from 30 to 75 feet—usually at less than 50 feet—an abundance of pure water is found. This can be raised to the surface by windmills or hand pumps, thus furnishing water for the stock and for use in the dairy. Many dairymen have arrangements by which a windmill raises the water, and it flows through a pipe into the dairy house, filling a tank in which the milk is set. The water is kept fresh and the overflow runs to troughs in the stock yards and barns for the use of the animals. A much larger number of farmers, however, depend on surface ponds for stock water supply. As usually made and cared for, these are quite objectionable. It should be explained that underlying the soil of most of this Western prairie country there is a clay or hardpan which is quite impervious to water. By choosing a place on a hillside, removing the surface soil and clay and making a dam on the lower side, a basin is formed which catches water from the shed above. Properly located so as to get the water from grass land, and fenced to prevent stock from getting into it, this water is pure and good, although not as clean as well water. In winter it is too cold for cows, and in summer too warm to be palatable. These two objections can be overcome by providing a cistern into which the water from the pond is conducted, passing it through a filter of sand and charcoal. From this cistern the water can be pumped to supply the stock. In too many cases, however, the shallow pond, filled with surface water drawn frequently from sources which contaminate the supply, and in which the stock is allowed to stand, is the only provision made for drinking water for the cows; hogs often have access to the same pool. This gets very warm and foul in summer, and in winter the cows are allowed to drink once a day or possibly only once in two days from holes cut through the ice. It is needless to say that men who attempt to keep dairy cows under such conditions are not advancing their own interests or those of the State.

CLASSIFICATION OF DAIRIES.

Dairying in Missouri may be classified as elsewhere: Farm butter dairies, creameries, cheese factories, milk dairies for local supply, others which furnish milk to more distant markets, and some dairy specialties.

FARM DAIRIES.

There is little that distinguishes the farm-dairy practice of Missouri from that of other States. Good butter makers are by no means the rule, and the product of the farms, which varies greatly in quantity



and quality, is generally of a low grade. Local markets take up the supply at very low prices, and much of the butter is shipped in wretched condition from the country stores and villages to dealers and manipulators, who "renovate" it as best they can and work it over into passably commercial forms. The milk from which this variegated farm product is made is originally good enough, of full average quality, but the producing farmers lose half its value from ignorance of the art of home dairying or failure to join in cooperative effort or to patronize an established creamery. By far the greater number of cow owners follow the old and apparently more natural practice of letting

their animals calve in the spring. As a consequence, while there is a great flow of milk for a short period, summer heat and drought tend to rapidly diminish the yield and shorten the milking period of the cows. July, August, and September are, in Missouri, the most unsatisfactory part of the year for milk production and for handling milk. Pastures are short, water is scarce, flies are troublesome, general farm work pressing, and prices of dairy products at their lowest point. Yet nine-tenths of the cows in the State are milked during this period, and most of them at an actual loss, besides infinite annoyance to their owners. Few of the farmers seem to appreciate the very great advantages which result from letting the cows go dry in July and having them calve during the autumn months. There are some, however, who follow this plan, and derive the full benefit of the natural conditions of this section, which favor winter dairying. It is evident that these cases are serving as object lessons, and others are following these good examples.

The most progressive dairymen of the State expect their cows to each yield 25 pounds of milk a day during the first one hundred days, 20 pounds during the second one hundred days, and 15 pounds during the third, making a total of 6,000 pounds in three hundred days, leaving sixty-five days for recuperation. With proper facilities for raising cream, this milk worked into butter makes 240 pounds. A very few dairymen make their cows yield an average of 7,500 pounds of milk a year, from which they make 300 pounds of butter. Much the greater number of cows kept for dairy purposes in the State yield less than 4,000 pounds of milk a year, and from this the butter produced is less than 150 pounds.

CREAMERIES.

Next to the individual butter makers, patrons of creameries and cheese factories comprise the most numerous class of dairymen in Missouri and Kansas. There are in Missouri about 100 creameries in operation, 15 of which were built in the year 1895, also 25 cheese factories. (See map, page 12.) Kansas has about 150 creameries and cheese factories. (See map, page 14.) The year of 1896 was a fairly prosperous one and but few factories were closed, and these only because of local causes—bad management or lack of support by the farmers.

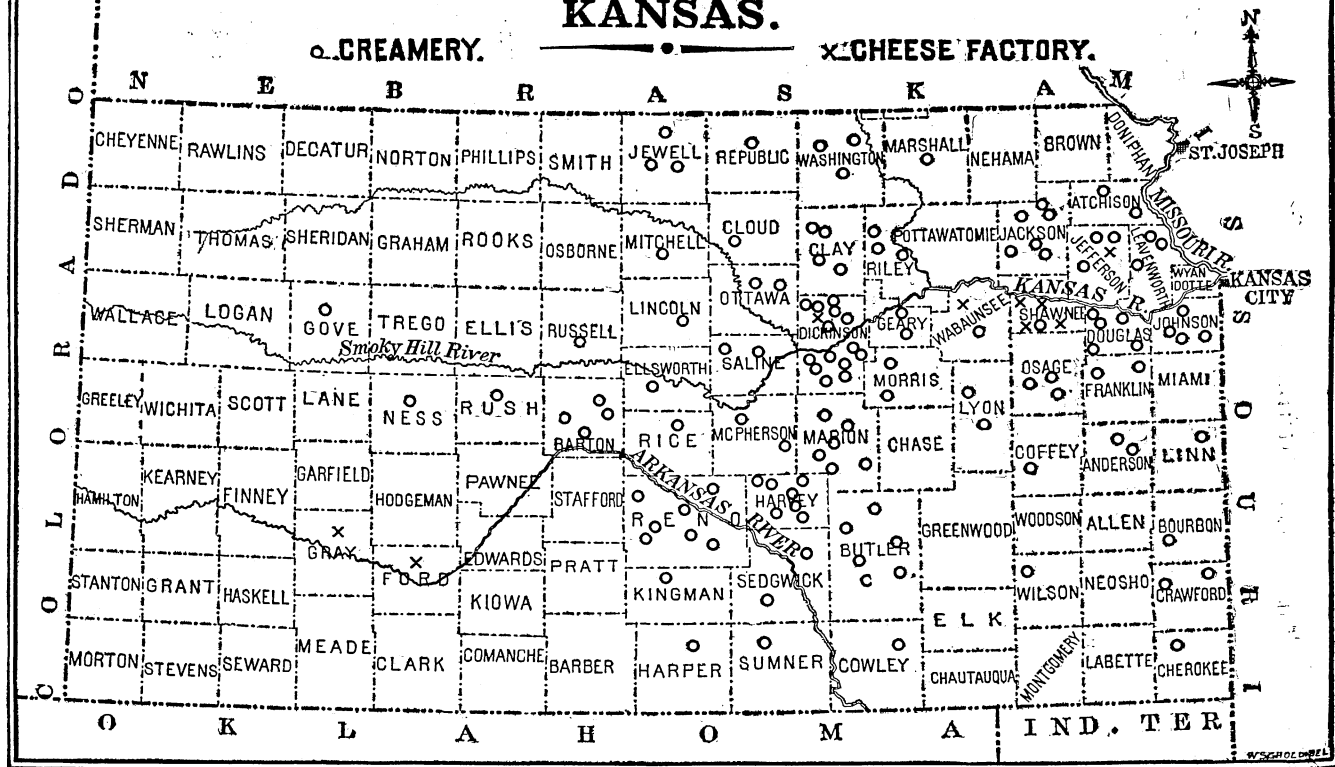
The most successful factories are those operated by the owners. Some are on the cooperative and joint-stock basis, and in a few cases they are managed quite satisfactorily. Nearly all are of the modern type of creameries, using separators and skimming the milk as brought to the factory, although there are a few gathered-cream plants. It is probable that another year will not find a single creamery in Missouri or Kansas operated on any other than the mechanical plan of separating the cream by centrifugal force.

Skimming stations are established at points where considerable milk can be had, yet not enough to warrant putting in a complete plant. To

LOCATION OF CREAMERIES & CHEESE FACTORIES IN THE STATE OF KANSAS.

○ CREAMERY.

× CHEESE FACTORY.



these the milk is hauled daily for separation and the cream is sent by wagon or rail to the central factory. By this method a much larger area of country can be handled, and success is much more certain than when the creamery must operate on a limited quantity of milk.

The development of the hand separator is changing the plan of operating creameries. Instead of the creamery being equipped with power separator and all the milk brought there for skimming, separators operated by hand or light power are being placed on the farms, the milk skimmed there, and only the cream delivered to the central factory, where it is ripened and churned into butter. This is a sort of combination of the advantages of the separator and of cream gathering and an improvement upon both. By this plan the farmers have the skimmed milk to feed to calves and pigs while yet warm and fresh, and the cost of hauling this to and from the factory is saved.

The factory in Missouri having the largest output of butter has but one separator, of the "Jumbo" pattern, and at times handles 14,000 pounds of milk a day. From the 4,640,834 pounds of milk received during 1895, 194,965 pounds of butter were made, and the patrons of the factory were paid \$29,640 during the year, on the fat-test basis.

The largest establishment of the kind in Kansas operates six factories, three of which have larger daily receipts of milk than any other in the State.

Another, organized in 1888, has now 13 factories and branches in operation in Kansas. This company, of which the secretary is president of the Kansas State Dairy Association, is the originator of the skimming-station idea in Kansas. It is putting in a number of these stations.

One of the great difficulties the creameries and cheese factories have to contend with is an insufficient supply of milk during a portion of the year, usually in winter, when they could be run to best advantage if the milk could be had. Nearly one-third of the factories have to close for about four months. The advantages in winter dairying, to both creamerymen and dairymen, are so marked, however, that, as already stated, the tendency is in that direction. It takes time to make this change in any dairy, even after the farmer has become convinced that it is desirable, the only quick way being to sell off the spring cows and replace them with those coming fresh in the fall. This is usually hard to do, from the fact that the latter class are scarce and high in price.

Some of the factories run three hundred and sixty-five days in the year, but in most cases the plants are not operated on Sundays, the farmers using the Sunday milk for supplying their families with butter.

Prices paid to patrons of creameries and cheese factories under different systems of buying milk have been reported as follows:

A creamery at Fairfax, Mo., making, in 1895, 10,102 pounds of butter and 5,880 pounds of cheese, paid per 100 pounds of milk, in

January, 80 cents; February, 72 cents; March, 64 cents; April to August, inclusive, 60 cents; September, 64 cents; October and November, 80 cents; December, 74 cents.

A creamery at Bethany, Mo., paid, on the butter-fat test: May, June, and July, 7 cents per pound; August and September, 8 cents; October, 11 cents; November and December, 12 cents.

A creamery at Holden, Mo., making 100,000 pounds of butter in 1895, paid, on butter-fat test: May, June, and July, 15 cents; August, 16 cents; September, 17 cents; October, 18 cents; November, 19 cents; December, 20 cents—equivalent to an average of 64 cents per 100 pounds of milk; and one at Smithton, Mo., paid an average of 65 cents per 100 pounds of milk.

At Concordia, Mo., a creamery paid an average of 17 $\frac{3}{4}$ cents per pound of butter fat, and a cheese factory at Appleton City, Mo., paid an average of 75 cents per 100 pounds of milk.

The product of the creameries in Missouri is usually shipped to St. Louis, Chicago, and New York, nearly all being packed in 60-pound tubs.

The leading dairy counties of Missouri and Kansas are easily seen by reference to the maps.

CHEESE FACTORIES.

Cheese factories are not so popular in Missouri and Kansas as creameries, yet the demand for good cheese is better than that for butter. Most of the cheese made is sold from wagons sent out by the factories and making regular trips through the surrounding country. When purchased at stores, consumers have to pay from 12 $\frac{1}{2}$ to 15 cents a pound for cheese which costs the merchants about 10 cents.

From the prices reported as being paid for milk by both cheese factories and creameries, cheese making seems to be fully as profitable as butter, both to factories and patrons.

The skimmed milk from the creamery is regarded as more valuable by the farmer, for feeding to calves and pigs, than is the whey from cheese making. The creameries usually sell the skimmed milk back to the farmers at 1 cent a gallon or 10 cents per hundred pounds. This is variously estimated by the farmers as being worth from 10 to 25 cents per hundredweight as food for growing stock.

The average quality of the cheese made in Missouri and Kansas is not as good, comparatively, as that of the butter from the creameries of these States.

MILK SUPPLY.

As is the case in most of the States west of the Mississippi River, cities and populous towns in Missouri are few and far between. With the exception of St. Louis, Kansas City, St. Joseph, Hannibal, Chillicothe, Sedalia, Jefferson City, Moberly, and Springfield, the towns are of a size and character which permit numerous residents to keep cows

for supplying their families with milk and butter. There will usually be found, however, in the vicinity of every county seat and of other towns of 1,000 population and over, one or more dairymen who make a business of supplying from wagon the local demand for milk. Such dairymen keep an average of about 10 cows in milk. Probably four-fifths of these animals are grade Shorthorns in blood, but many owners are introducing the Jerseys and rapidly grading up with this breed. About 3 per cent of the cows now are nearly pure Jerseys. The Holstein is a favorite with other dairymen, especially for milk production. About 1 per cent of the cows are of this breed.

The methods pursued by farmers who supply milk by wagon to near-by customers in villages and towns are those familiar in nearly all parts of the country. The milk is generally served by dipping from large cans, and is rarely properly cooled, if at all, before leaving the farms where it is produced. The producers and dealers in the towns are opposed to using bottles. They claim that the labor of filling and cleaning and the losses from breakage are too great, and that customers are unwilling to pay this additional cost.

The price of milk delivered to large consumers or small dealers ranges from 12 to 15 cents per gallon in summer and a cent or two more in winter. The retail price per quart is very generally 5 cents throughout the year.

Milk dairymen and dealers seem loath to change their methods of handling, and consumers do not encourage the introduction of innovations by paying more for a superior quality or patronizing dealers who make efforts to handle only pure milk. Very few aerators are in use in Missouri and Kansas. Dependence for cooling milk is mainly an open tank of cold well water, into which the cans are set after milking at night.

DAIRY SPECIALTIES.

An extensive business in making Swiss cheese is being developed at California, Mo. There are five factories in the county, one of which has been in operation twenty years. The others have been lately established. The annual output is now 125,000 pounds. Milk is delivered twice a day, for which 70 cents a hundred is paid, the whey being returned to the patrons. This cheese sells at 11 and 12 cents per pound for No. 1, and 9 and 10 cents for No. 2. It is shipped principally to Southern markets. Imitations of foreign kinds of cheese are not made in Kansas except in a very limited way; but a small amount of Swiss cheese is made at Enterprise.

There are no factories for condensing milk in Missouri or Kansas. One Missouri company, in connection with its other business, does something in this line at places in Illinois.

Pasteurized milk is prepared by a dairy company of St. Louis, at Highland, Ill., where the milk is produced. The bottled milk is sent by rail to St. Louis and delivered to customers at 10 cents per quart.

This company makes a special effort to secure pure and healthy milk. The dairy farms from which its supply of milk comes are regularly inspected as to the sanitary condition of the entire premises and the health of the cows. A dairy firm at Kansas City has a pasteurizing apparatus in their city depot. The product is sold in bottles at 6 cents a quart, being only 1 cent more than the regular retail price of milk not thus treated.

The application of science in such forms as the Babcock tester and the centrifugal separator, or skimming machine, to the old-fashioned business of dairying is doing much to revolutionize ideas and methods. With the adoption of improved apparatus for manipulating the product of the cows, the application of scientific principles in breeding and feeding them is also coming into practice.

INSPECTION.

The dairying of this section has not made much demand upon veterinary science for assistance, although there are those who believe that this will soon become necessary. Unquestionably there are numerous cases of tuberculosis among our dairy cattle. Missouri has an efficient veterinary service under the control of the State board of agriculture, but thus far it has not been empowered by law to deal with tuberculosis. The State board of health and the board of agriculture have had under consideration how to best bring about a veterinary supervision of the dairy stock of Missouri. The consumers of dairy products should be protected against the possible danger of contracting disease from milk, butter, or cheese containing germs of different maladies. Fighting disease on this line is a work which must be inaugurated and carried forward by State authority solely, probably for many years to come.

DAIRY SUBSTITUTES.

There is now in Missouri effective legislation against making and selling imitations of butter, but none controlling the manufacture and sale of filled cheese.

Kansas has no laws controlling the sale of imitation butter or filled cheese.

The last general assembly of Missouri enacted a law regarding frauds in dairy goods and their substitutes, and its enforcement was placed with the State board of agriculture, \$5,000 being appropriated to meet the expense for two years.

During 1895, the first year the law was on the statute books, only 70 government licenses were issued in the State, while the year before 450 had been issued. Of these 70, all but 10 were taken out in St. Louis and Kansas City. A number of prosecutions were made by the board for violations of the law, and in every instance where the cases came to trial the validity of the law was sustained.

As to the effect of this law, the following statements are made by men in St. Louis who are well qualified to give opinions:

Hofman Bros.: Since its enactment and the appointment of a local agent for enforcement, the sale of pure butter has materially increased. We are able to sell large quantities of farm dairy butter now, while prior to the enactment of this law it was almost impossible to sell anything but fancy creamery.

W. A. Hudson: We are pleased at the wonderful improvement in this market for butter the past six months. One year ago country roll was almost unsold at 5 to 8 cents per pound, and the same goods are now worth from 10 to 16 cents per pound and closely sold up. The law has been a great boon, chiefly to the small farmer, but also to the creamery. To show the necessity for this encouragement, this house alone has sent out of the State for butter as much as \$365,000 in one year, and it is estimated that this city sends out \$2,000,000 annually for dairy supplies. We really believe the effect of the new oleo law will benefit the farmers of Missouri the first year of its operation over \$1,000,000, and this benefit will increase year by year as the blighted industry will revive, until the \$2,000,000 sent out of this city will be paid to our own farmers.

William N. Tivy: The law has been of great benefit. The representations made to the governor and the senate when this law was under consideration have been verified and fulfilled. The production of pure butter has increased in this State and found sale at fair prices. The purchase of butter from Illinois, Wisconsin, Iowa, and other States, and the sending of large sums of money to them, must diminish and ultimately cease.

Hassendeubel Bros.: The benefit and effect so far of the enforcement of the oleo law have exceeded our expectations. If our legislators could spend an hour in some grocery store in the tenement district and see how these poor people were robbed by selling oleo at 25 to 30 cents a pound as pure butter, they would not doubt the justness of this law. Yes; the benefits and effects are great. Continue to protect the farmer and the workingman.

DAIRY ORGANIZATIONS.

The Missouri State Dairymen's Association was organized in the fall of 1890 on a call issued by Levi Chubbuck, then secretary of the Missouri State board of agriculture. The meeting for organization was held at Kansas City. The first annual meeting was held at Jefferson City January 15, 1891. The organization has had no direct help from the State for its work. It was through the personal efforts of its members that the passage of the anti-oleo law was secured last winter.

The Kansas State Dairy Association, J. L. Hoffman, Newton, Kans., secretary, is the only dairy or creamery organization in that State. The State Dairy Association worked for a law at the last session of the legislature and almost succeeded in getting a bill passed regulating the sale and manufacture of oleomargarine and imitation butter products, but the effort was defeated at the last moment. The State Dairy Association is greatly hampered in its work by lack of funds. All the aggressive campaigns against oleomargarine have been made with private subscriptions among members of the association.

APPENDIX.

CREAMERIES AND CHEESE FACTORIES IN MISSOURI AND KANSAS.

Creameries in Missouri—1896.

NORTHEAST SECTION.

County.	Name.	Post-office.	County.	Name.	Post-office.
Adair.....	Reuben Davidson..	Brashear.	Lincoln.....	Truxton Creamery.	Truxton.
Do.....	John Patterson.....	Kirkaville.	Do.....	Do.....	Old Monroe.
Audrain.....	B. R. Cauthorn,	Mexico.	Do.....	Elsberry Creamery.	Elsberry.
Do.....	president.		Linn.....	W. B. Loomis.....	Meadville.
Do.....	Martinsburg.....	Martinsburg.	Pike.....	Louisiana Cream-	Louisiana.
Do.....	Do.....	Vandalia.		ery.	
Callaway.....	Fulton Creamery...	Fulton.	Do.....	Frankford Cream-	Frankford.
Lewis.....	La Grange.....	Lagrange.	Do.....	ery.	
Do.....	Canton Creamery..	Canton.	Do.....	Paynesville Cream-	Paynesville.
Do.....	Monticello Cream-	Monticello.	Do.....	ery Co.	
	ery.		Scotland....	Clover Dale Cream-	Memphis.
Lincoln.....	Moscow Creamery	Moscow Mills.	Do.....	ery Co.	
Do.....	Co.		St. Charles..	New Era Creamery	New Melle.
Do.....	Silex Creamery....	Silex.	Do.....	Co.	
Do.....	Winfield Creamery	Winfield.	Sullivan.....	Do.....	Greencastle.
	Co.		Do.....	Do.....	Harris.

NORTHWEST SECTION.

Andrew.....	J. J. Bateman.....	Empire Prai-	Dekalb.....	L. C. Frey.....	Amity.
Do.....	Rose Creamery....	rie.	Grundy.....	Do.....	Edinburg.
Do.....	Missouri Star	Savannah.	Do.....	Do.....	Laredo.
	Creamery.	Rosendale.	Harrison....	L. L. Long.....	Bethany.
Do.....	Rea Creamery.....	Rea.	Do.....	S. P. Davidson....	Cainsville.
Do.....	Helena Creamery..	Helena.	Do.....	Mound City Cream-	Ridgeway.
Do.....	Mr. Rose (Savan-	Cawood.		ery.	
	nah).		Jackson.....	Do.....	Blue Springs.
Do.....	Crosby Creamery...	Crosby.	Do.....	Wm. Potcet.....	Westport.
Atchison....	Pine Hill Creamery	Fairfax.	Do.....	L. C. Frey.....	Hickman
	(E. H. White).			Do.....	Mills.
Buchanan....	American Cream-	St. Joseph.	Lafayette...	Corder Creamery	Corder.
Do.....	ery Co.		Do.....	Co.	
Do.....	St. Joseph Cream-	Do.	Do.....	Concordia Cream-	Concordia.
Do.....	ery Co.		Do.....	ery Co.	
Do.....	Star Creamery Co..	Do.	Do.....	Alma Creamery Co.	Alma.
Carroll.....	Elm Hill Creamery	Grace.	Do.....	Mayview Creamery	Mayview.
Do.....	Co.		Do.....	Co.	
Do.....	Hale Creamery.....	Hale.	Livingston..	Adams & Son.....	Chillicothe.
Do.....	Norborne Creamery.	Norborne.	Do.....	Do.....	Dawn.
Clay.....	Do.....	Moscow.	Platte.....	Do.....	Platte City.
Dekalb.....	S. W. Cook & Son..	Maysville.	Do.....	Woodruff Creamery.	Woodruff.

SOUTHWEST SECTION.

Bates.....	Hume Creamery Co.	Hume.	Henry.....	Montrose Creamery	Montrose.
Do.....	Rockville.....	Rockville.	Do.....	Co.	
Cass.....	Garden City Cream-	Garden City.	Johnson....	J. C. Bail (2 cream-	Warrens-
Do.....	ery.		Do.....	eries).	burg.
Do.....	East Lynne Cream-	East Lynne.	Do.....	Centerview Cream-	Centerview.
Do.....	ery.		Do.....	ery.	
Christian....	Ozark Creamery....	Belton.	Do.....	Walter S. Dille...	Holden.
Dade.....	Lockwood Cream-	Ozark.	Do.....	Do.....	Fayetteville.
Do.....	ery Co.	Lockwood.	Lawrence...	Freistatt Creamery.	Freistatt.
Do.....	Meinert Creamery	Meinert.			
	Co.				

Creameries in Missouri—1896—Continued.

SOUTHEAST SECTION.

County.	Name.	Post-office.	County.	Name.	Post-office.
Cape Girardeau.	Wm. B. Schaefer ...	Jackson.	Perry.....	Brewer Creamery Co.	Brewer.
Do.....	Appleton Creamery	Appleton.	Do.....	Plant and creamery.	Perryville.
Do.....	Pocahontas	Pocahontas.	Do.....	Altenburg Creamery.	Altenburg.
Do.....	Friedheim	Friedheim.	Do.....	Longtown Creamery.	Longtown.
Do.....	Gordonville	Gordonville.	St. Francois	Bonne Terre Creamery.	Bonneterre.
Do.....		Cape Girardeau.	St. Genevieve.	St. Genevieve Creamery.	St. Genevieve.
Franklin		Villa Ridge.	Do.....	Bloomsdale Creamery.	Bloomsdale.
Do.....		Washington.	Scott	New Hamburg Creamery.	New Hamburg.
Jefferson	Hillsboro Creamery	Hillsboro.	Stoddard ...	Bloomfield Creamery.	Bloomfield.
Do.....	Jarvis Creamery ...	Jarvis.	Washington.	Thos. A. Welch	Baryties.
Do.....	Jefferson County Creamery.	Hillsboro.			
Do.....	Seckman Creamery.	Seckman.			
Do.....	Chas. J. Hogan	Hematite.			
Do.....	Emanuel Hoffman ..	Vineland.			
Do.....	Herculeum Creamery.	Herculeum.			
Perry.....	Creamery Co.....	Frohna.			

CENTRAL SECTION.

Benton	New Creamery Co..	Cole Camp.	Pettis	Smithton Creamery Co.	Smithton.
Boone	Centralia Creamery Co.	Centralia.	Do.....	Georgetown Creamery Co.	Georgetown.
Do.....	Columbia Creamery	Columbia.	Saline	Sweet Springs Creamery Co.	Sweet Springs
Chariton	Wien Creamery Co.	Wein.			
Cooper	Lone Elm Creamery	Lone Elm.			

Cheese factories in Missouri.

NORTHEAST SECTION.

County.	Name.	Post-office.	County.	Name.	Post-office.
Knox.....	Jos. Taylor.....	Newark.	Sullivan....	M. S. Parry.....	Green City.
Montgomery.	H. C. Lewelling ...	High Hill.	Do.....	do.....	Milan.

NORTHWEST SECTION.

Andrew	Lewis Sargent	Bolckow.	Clinton.....	Turney Cheese Factory.	Turney.
Caldwell.....		Kerr.	Daviess		Winston.
Do.....		Cowgill.	Gentry	Berlin Creamery Co.	Berlin.
Do.....	—— (McDaniel) ..	Kidder.	Do.....	King City Dairy Co.	King City.
Do.....	Prairie Gem Cheese Factory.	Cameron.	Holt.....	J. M. Clark.....	Mound City.
Do.....	McCrae Bros. Cheese Factory.	Do.	Nodaway...	Cole & Smith	Barnard.
Clinton.....	Moore & Moulton..	Do.			

SOUTHWEST SECTION.

Bates.....	Prairie City Factory.	Prairie City.	St. Clair ...	2 Appleton City cheese factories.	Appleton City.
Greene	Republic Cheese Factory.	Republic.	Do.....	Taberville Cheese Factory.	Taberville.

CENTRAL SECTION.

Moniteau....	C. Haldiman & Co. (Swiss).	Jamestown.	Pettis	E. N. & W. D. Norton.	Sedalia.
Do.....	C. Haldiman & Co. (4 Swiss ch. facs).	California.	Do.....	M. S. Elliott.....	Do.
			Do.....	C. P. Sheperd.....	Do.

Dairy companies in Missouri.

County.	Name.	Post-office.	County.	Name.	Post-office.
Jackson	Midland Dairy Co.	Kansas City.	St. Louis City	Union Dairy Co. ...	St. Louis.
Do.	Kansas Creamery and Supply Co.	Do.	Do.	Bonne Terre Dairy Co.	Do.
Do.	Dickey Dairy Co. ...	Do.	Do.	Graffemann Dairy Co.	Do.
Do.	Mo. Dairy Ass'n.	Do.			
St. Louis City	St. Louis Dairy Co.	St. Louis.			

Leading farm butter dairies in Missouri.

County.	Name.	Post-office.	County.	Name.	Post-office.
Adair.	John Patterson ...	Kirksville.	Marion.	B. C. Settles.	Palmyra.
Atchison.	Dan Drago.	Langdon.	Montgomery.	A. W. Hathaway ...	High Hill.
Callaway.	J. L. Erwin.	Steedman.	Nodaway.	J. W. Harman.	Barnard.
Henry.	Goodrich Bros.	Calhoun.	Pettis.	W. H. H. McVey ...	Sedalia.
Do.	H. T. Burris.	Clinton.	Do.	G. B. Lamm.	Do.
Do.	Thos. Day.	Lewis Sta.	Do.	S. R. Landis.	Do.
Do.	Armstrong Bros.	Clinton.	Do.	H. Green.	Do.
Do.	Joseph Elliott.	Windsor.	Do.	N. K. Leiter.	Do.
LaFayette.	T. C. Sawyer.	Lexington.	Do.	A. Dow & Sons.	Georgetown.
Livingston.	Mart Brooks.	Cavendish.	Schuyler.	Wood O'Brien.	Lancaster.
Do.	J. Strong.	Do.	St. Charles.	Leo Hayden.	St. Paul.
Do.	C. K. Moser.	Chillicothe.	Do.	A. Woodhull.	Foristell.
Do.	J. W. McCune.	Avalon.	Webster.	A. S. Monett.	Marshfield.
Marion.	Col. W. H. Hatch ...	Hannibal.			

Creameries in Kansas—1896.

County.	Name.	Post-office.	County.	Name.	Post-office.
Anderson.	Greeley.	Greeley.	Dickinson.	A. G. Eyth.	Woodbine.
Do.	J. N. Morris.	Garnet.	Do.	A. D. Blanchard.	Herington.
Atchison.	J. L. Fuller.	Atchison.	Do.	Hope Creamery Co.	Hope.
Do.	S. A. Kepner.	Ellingham.	Do.	Belle Springs Creamery Co.	Dillon.
Barton.	Heizer Creamery Co.	Heizer.	Do.	do.	Belle Springs.
Do.	Logan Township Creamery Co.	Cliffin.	Do.	do.	Holland.
Do.	Ellinwood Creamery and Mfg. Co.	Elinwood.	Do.	A. G. Eyth.	Solomon.
Do.	W. G. Merrill & Co.	Great Bend.	Do.	do.	Enterprise.
Bourbon.	Fulton Creamery Co.	Fulton.	Do.	Belle Springs Creamery Co.	Ablene.
Butler.	Lewelling & Co.	Angusta.	Douglas.	Douglas County Creamery Co.	Lawrence.
Do.	D. N. Lambert.	Elbing.	Do.	Eudora Creamery Co.	Eudora.
Do.	Towanda Creamery Co.	Towanda.	Do.	Lone Star Creamery Co.	Bond.
Do.	Sunflower State Creamery Co.	El Dorado.	Do.	Big Springs Creamery Co.	Big Springs.
Do.	C. C. Miller.	Leon.	Do.	J. G. Knox.	Baldwin.
Do.	Hesston Creamery.	Whitewater.	Ellsworth.	Crofoot Creamery.	Wilson.
Cherokee.	E. B. Davis.	Columbus.	Franklin.	Wellsville Creamery Co.	Wellsville.
Clay.	Clay Center Creamery Co.	Clay Center.	Do.	Richmond Creamery Co.	Richmond.
Do.	Morganville Creamery Co.	Morganville.	Geary (or Davis).	Oakwood Creamery Co.	Junction City.
Do.	Chapman Valley Creamery and Mfg. Co.	Oak Hill.	Do.	B. F. Small.	Welcome.
Do.	Belle Springs Creamery Co.	Longford.	Gove.	R. H. Goodsell.	Quinter.
Cloud.	C. F. Armstrong.	Clyde.	Harper.	Hesston Creamery Co.	Harper.
Coffey.	Waverly Creamery.	Waverly.	Do.	Burrton Creamery Co.	Burrton.
Cowley.	J. P. Baden.	Winfield.	Do.	Hesston Creamery Co.	Hesston.
Crawford.	D. H. Young.	Girard.	Do.	do.	Halstead.
Do.	Beulah Creamery Co.	Beulah.	Do.	do.	Newton.
Dickinson.	Belle Springs Creamery Co.	Talmage.	Do.	Sedgwick Butter and Cheese Co.	Sedgwick.
Do.	Manchester Creamery Co.	Manchester.	Do.	Trousdale Creamery Co.	Trousdale.
Do.	Geo. W. Hanna.	Industry.	Do.	Walton Creamery Co.	Walton.
Do.	Oakwood Creamery Co.	Moonlight.	Jackson.	B. F. Fisher.	Soldier.
Do.	Chapman Creamery Co.	Chapman.			

Creameries in Kansas—1896—Continued.

County.	Name.	Post-office.	County.	Name.	Post-office.
Jackson	G. R. Bowser	Circleville.	Morris	Gustave Dieckel-	White City.
Do	J. G. Knox & Son ..	Hoyt.	Do	man.	
Do	H. R. Dutt	Birmingham.	Do	Wilsey Creamery	Wilsey.
Do	Holton Creamery	Holton.	Do	Co.	
Do	W. B. Fees & Co. ...	Whiting.	Ness	Ness City Cream-	Ness City.
Jefferson	Winchester Cream-	Winchester.	Do	ery Co.	
Do	ery Co.		Osage	Carbondale Cream-	Carbondale.
Do	Meriden Creamery	Meriden.	Do	ery Co.	
Do	Co.		Do	Lyndon Creamery	Lyndon.
Do	J. C. Evans & Son ..	Valley Falls.	Do	Co.	
Jewell	Burr Oak	Burr Oak.	Do	Overbrook Cream-	Overbrook.
Do	Goodwin Bros.	Mankato.	Do	ery Co.	
Do	C. L. Emery	Formoso.	Ottawa	T. N. Creveling. ...	Bennington.
Johnson	Morse Creamery Co	Morse.	Do	Minneapolis Butter	Minneapolis.
Do	Spring Hill Cream-	Spring Hill.	Do	and Cheese Co.	
Do	ery Co.		Reno	Parker & Upde-	Hutchinson.
Do	Edgerton Creamery	Edgerton.	Do	graph.	
Do	Co.		Do	Salt Creek Cream-	Partridge.
Do	Gardner Creamery	Gardner.	Do	ery Co.	
Kingman	D. N. Gish & Bro ..	Kingman.	Do	D. N. Gish & Bro..	Hutchinson.
Leavenworth ..	Basehor Creamery	Basehor.	Do	Hesston Creamery	Butler.
Do	Co.		Do	Co.	
Do	Crescent Hill	Reno.	Do	D. N. Gish & Bro.	Nickerson.
Do	Creamery.		Do	Haven Creamery	Haven.
Do	G. W. Wilkerson ...	Tonganoxie.	Do	Co.	
Lincoln	Golden Belt Cream-	Beverly.	Do	Arlington Cream-	Arlington.
Do	ery Co.		Do	ery Co.	
Linn	Eastern Kansas	Blue Mound.	Republic ...	Belleville Creamery	Belleville.
Do	Creamery Co.		Rice	Steiling Creamery.	Steiling.
Lyon	P. S. Miller	Neosho Rap-	Riley	A. L. Goble & Co..	Riley.
Do	ids.	Emporia.	Do	F. L. Erpalding. ...	Leonardville.
Do	Emporia Creamery	Emporia.	Do	Hanna Produce Co.	Lasita.
Do	Co.		Do	McCracken Cream-	McCracken.
Marion	Ahler Bros.	Marion Cen-	Rush	ery Co.	
Do	Hillsboro Creamery	ter.	Russell	L. Banker & Co. ...	Russell.
Do	Co.	Hillsboro.	Do	Belle Springs	Gypsum City.
Do	Funk & Co.	Durham.	Do	Creamery Co.	
Do	A. L. Beltz	Ramona.	Do	T. M. Kent, M'gr..	Brookville.
Do	Lincolnville Cream-	Lincolnville.	Do	J. A. Morrow.	Richland.
Do	ery Co.		Sedgwick ...	C. A. Welsh.	Maize.
Marion	Hesston Creamery	Peabody.	Do	Lewelling & Co.	Wichita.
Do	Co.		Sumner	Wellington Cream-	Wellington.
Marshall	Walker Bros.	Marysville.	Do	ery	
McPherson ..	Brandt & Essley ...	Canton.	Wabaunsee ..	F. & H. Stueve.	Alma.
Do	Brandt & Essley ...	Moundridge.	Do	Haskell & Bosworth	Hanover.
Mitchell	Jensen Bros.	Beloit.	Do	Geisfeld Bros.	Palmer.
			Do	H. Lindeman.	Linn.
			Wilson	Meadowbrook	Fredonia.
				Creamery.	

Cheese factories in Kansas.

County.	Name.	Post-office.	County.	Name.	Post-office.
Dickinson ...	Rhinehart Cheese	Rhinehart.	Shawnee	J. A. Morrow	Richland.
Do	Co.		Do	H. N. Pond.	Topeka.
Ford	Spearville Cheese	Spearville.	Do	Wm. A. Boles.	Valencia.
Do	Factory.		Do	Wm. Granville.	Dover.
Gray (or	Cimarron Cheese	Cimarron.	Wabaunsee ..	T. A. Rutledge.	Keene.
Footes).	Factory.				
Jefferson	Nortonville Cheese	Nortonville.			
Do	Mfg. Co.				